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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,990	02/12/2002	Nigel T. Birch	84572	3516

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EXAMINER

RODRIGUEZ, WILLIAM H

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 06/25/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/072,990

Applicant(s)

BIRCH ET AL.

Examiner

William H. Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 13-15, 17-21, 23, 25, 30, 34-36, 41, 43, 46, 48-55 and 57 is/are rejected.
- 7) ☒ Claim(s) 6-12, 16, 22, 24, 26-29, 31-33, 37-40, 42, 44, 45, 47 and 56 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/24/02 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

- ✓ 1. The specification is objected to because the following titles are missing: Background of the Invention, Field of the Invention, Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98, Brief Summary of the Invention, Brief Description of the Several Views of the Drawing(s) and Detailed Description of the Invention. Correction is required.

Title

- ✓ 2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: --A Gas Turbine Engine Exhaust Nozzle Having A Noise Attenuation Device Driven By Shape Memory Material Actuators--.

Claim Objections

3. Claims 4, 21, 27,31-33, 36, 37, 41, 44 45 are objected to because of the following informalities.
- ✓ 4. Claim 4 line 25 of page 33 recites “ a radially outer part”. The word “a” should be replaced by --said-- before “radially” and after “to”. Appropriate correction is required.
- ✓ 5. Claim 21 reads, “the electrostrictive material the tab is moved from the second non-deployed position and the first deployed position”. It is believed that a linking word is missing between the words “the electrostrictive material” and “the tab”. Also, it is believed that the word “and” should be replaced by the word --to-- before “the” and after “position”. Appropriate correction is required.

- ✓6. Claim 27 line 2 of page 37 recites “ a tab”. The word “a” should be replaced by --said-- before “tab” and after “wherein”. Appropriate correction is required.
- ✓7. Claim 27 line 2 of page 37 recites “a second non-deployed position”. The word “a” should be replaced by --said-- before “second” and after “in”. Appropriate correction is required.
- ✓8. Claim 27 line 3 of page 37 recites “ a recess”. The word “a” should be replaced by --said-- before “recess” and after “occupies”. Appropriate correction is required.
- ✓9. Claims 31-33, 36 and 37 recite the limitation "the nozzle wall". There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.
- ✓10. Claim 41 recites the limitation "the shape memory element" in line 20. There is insufficient antecedent basis for this limitation in the claim.
- ✓11. Claims 44 and 45 recite the limitations “a first deployed position; a second non-deployed position”. The word “a” should be replaced by --said-- before “first and second” respectively. Appropriate correction is required.

Drawings

12. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “engine exhaust nozzle comprising an outer bypass exhaust nozzle and an inner core exhaust nozzle of **a lobed mixer type** (claims 51 and 52)” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

15. Claim 4 recites “a radially inner position.....”. It is not clear if this sentence should read “a radially inner part”. Also, if the sentence is correct, it is not clear where such radially inner position is located in the drawings being presented. Examiner suggests rewriting claim 4 to make clear what applicant is trying to claim as the invention. As written, one cannot make a correlation between the elements being claimed and the drawings being presented. Appropriate correction is required.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

17. Claims 1, 2, 3, 5, 13-15, 17-21, 23, 25, 30, 41, 43, 48-50, 53, 55 and 57 are rejected under 35 U.S.C. 102(e) as being anticipated by **Rey et al. (U.S. Patent No. 6,318,070)**.

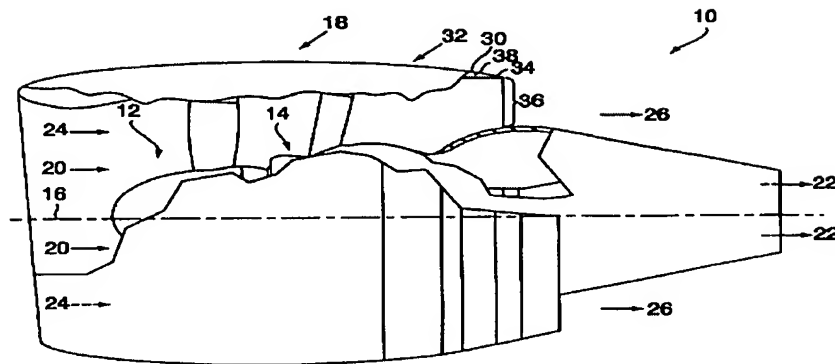


FIG. 1

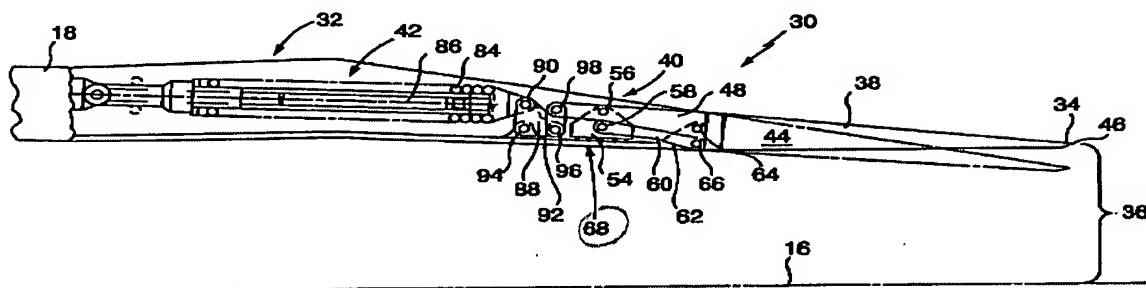


FIG. 2

- 18. With respect to claim 1, **Rey et al.** teach a gas turbine engine exhaust nozzle arrangement for the flow of exhaust gases therethrough between an upstream end and a downstream end thereof comprising a nozzle, a downstream portion and a plurality of tabs 38, each tab 38 extends in a generally axial direction from the downstream portion of the nozzle wherein the nozzle further comprises an actuation mechanism capable of moving the tabs between a first deployed position, in the first position the tabs interact with a gas stream to reduce exhaust noise thereof, and a second non-deployed position, in the second position the tabs are substantially aerodynamically unobtrusive. See particularly **Figures 1 and 2 of Rey et al.**
- ✓ 19. With respect to claim 2, **Rey et al.** teach that the plurality of tabs 38 are circumferentially disposed about the nozzle. See particularly **Figures 1 and 2 of Rey et al.**

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20. With respect to claim 3, **Rey et al.** teach that the actuation mechanism comprises a shape memory material element 68. See particularly **Figure 2 of Rey et al.**

21. With respect to claim 5, **Rey et al.** teach that the periphery of the nozzle defines a pocket therein and at least a part of the element 68 is generally disposed within the pocket. See particularly **Figure 2 of Rey et al.**

22. With respect to claim 13, **Rey et al.** teach that the actuation mechanism 68 is actuated in a response to an applied field. See particularly column 4 lines 46-50 and column 6 lines 26-29 of Rey et al.

23. With respect to claim 14, **Rey et al.** teach that the field is a temperature flux. See particularly column 4 lines 46-50 and column 6 lines 26-29 of Rey et al.

24. With respect to claim 15, **Rey et al.** teach that the field is an electric current. See particularly column 4 lines 46-50 and column 6 lines 26-29 of Rey et al.

✓ 25. With respect to claims 17, 18 and 23, **Rey et al.** teach that the shape memory material element 68 comprises a plurality of strands 70 forming an array 72, and each strand 70 is formed from a plurality of shaped memory alloy (SMA) wires 74. The SMA wires can be either pure nickel-titanium (NiTi) alloy, or nickel-titanium alloy modified with various other elements or another material that exhibits shape memory effect. See particularly column 6 lines 56-59 of Rey et al.

26. With respect to claims 19-21, **Rey et al.** teach that to actuate the taps 38, the control system 81 applies heat or voltage across the SMA material to heat the SMA actuator. See particularly **Figure 6 of Rey et al.**

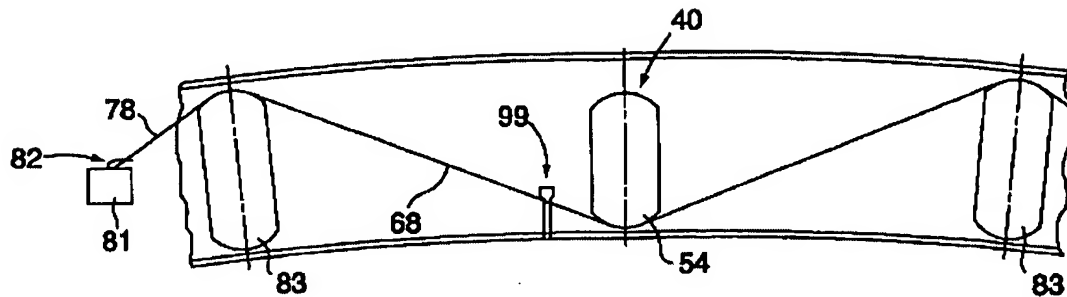


FIG. 6

- ✓ 27. With respect to claim 25, **Rey et al.** teach that the downstream portion of the nozzle comprises a downstream periphery, the plurality of circumferentially disposed tabs 38 extend in a generally downstream direction from the downstream periphery. See particularly **Figure 2** of **Rey et al.**
- ✓ 28. With respect to claim 30, **Rey et al.** teach that the tabs circumferentially taper in the downstream direction. See particularly **Figure 2** of **Rey et al.**
- ✓ 29. With respect to claims 41 and 43, **Rey et al.** teach that the taps 38 have a first shape in the deployed position and a second shape in the non-deployed position. In the deployed position, the first shape has a first length which is longer than a second length (when the tap is in the non-deployed position, second shape). See particularly **Figures 2, 3, 9 and 10** of **Rey et al.**

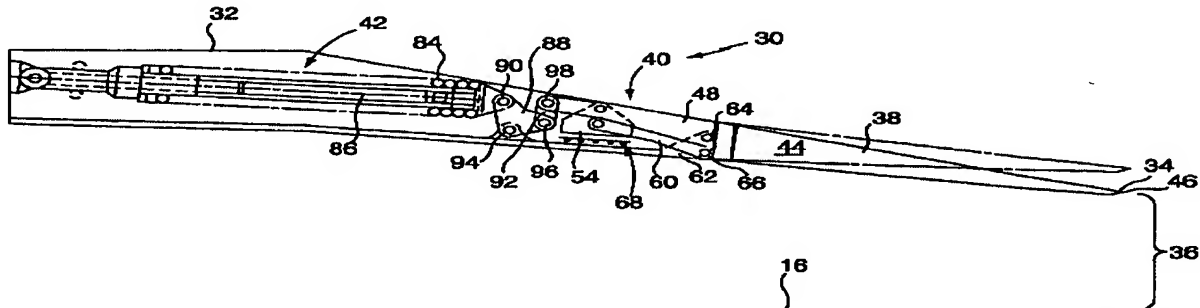


FIG. 3

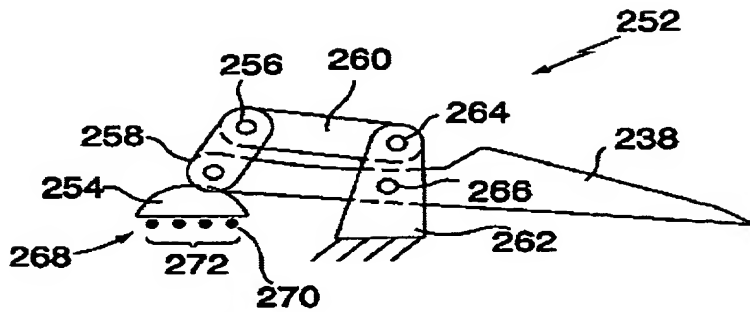


FIG. 9

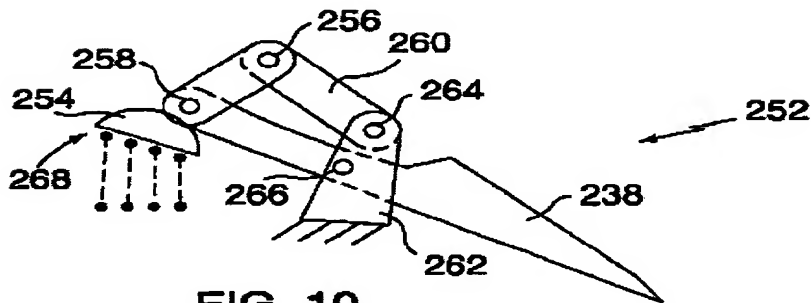


FIG. 10

- ✓ 30. With respect to claims 48-50, **Rey et al.** teach that exhaust nozzle arrangement comprises a core exhaust nozzle and a bypass exhaust nozzle. See particularly **Figure 1** of **Rey et al.**
- ✓ 31. With respect to claim 53, **Rey et al.** teach that the downstream end of the bypass nozzle is upstream of the downstream periphery of the core exhaust nozzle. See particularly **Figure 1** of **Rey et al.**
- ✓ 32. With respect to claim 55, **Rey et al.** teach that the tabs extend generally in a downstream direction. See particularly **Figure 2** of **Rey et al.**
- 33. With respect to claim 57, the operation of the prior art apparatus of **Rey et al.** will inherently perform the claimed method.

34. Claims 1, 2, 25, 30, 34-36, 46, 48, 54, 55 and 57 are rejected under 35 U.S.C. 102(b) as being anticipated by **Grotz et al. (U.K. 859,993)**.

35. With respect to claim 1, **Grotz et al.** teach a gas turbine engine exhaust nozzle arrangement for the flow of exhaust gases therethrough between an upstream end and a downstream end thereof comprising a nozzle, a downstream portion and a plurality of tabs 46, each tab 46 extends in a generally axial direction from the downstream portion of the nozzle wherein the nozzle further comprises an actuation mechanism capable of moving the tabs between a first deployed position, in the first position the tabs interact with a gas stream to reduce exhaust noise thereof, and a second non-deployed position, in the second position the tabs are substantially aerodynamically unobtrusive. See particularly **Figures 1-6** of Grotz et al.

36. With respect to claim 2, **Grotz et al.** teach that the plurality of tabs 46 are circumferentially disposed about the nozzle. See particularly **Figure 4** of Grotz et al.

37. With respect to claim 25, **Grotz et al.** teach that the downstream portion of the nozzle comprises a downstream periphery, the plurality of circumferentially disposed tabs 46 extend in a generally downstream direction from the downstream periphery. See particularly **Figures 4 and 5** of Grotz et al.

38. With respect to claim 30, **Grotz et al.** teach that the tabs 46 circumferentially taper in the downstream direction. See particularly **Figure 3** of Grotz et al.

39. With respect to claim 34, **Grotz et al.** teach that the tabs are of a substantially trapezoidal shape. See page 3 lines 121-126 of Grotz et al.

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40. With respect to claim 35, **Grotz et al.** teach that the general shape of the tabs is any one of the group comprising rectangular, square and triangular shape. See page 4 lines 122-125 of Grotz et al.

41. With respect to claim 36, **Grotz et al.** teach that the tabs are circumferentially disposed about the periphery of the nozzle wall to define substantially trapezoidal shaped notches between adjacent tabs. See particularly **Figure 3** of Grotz et al.

42. With respect to claim 46, **Grotz et al.** teach that the downstream periphery comprises straight edges, each straight edge having a tab disposed thereto. See particularly **Figure 2** of Grotz.

43. With respect to claims 48, **Grotz et al.** teach that exhaust nozzle arrangement comprises a core exhaust nozzle. See particularly **Figures 1 and 4** of Grotz et al.

44. With respect to claim 54, **Grotz et al.** teach that the invention can be used for exhaust noise suppression. See page 1 lines 64-66 of Grotz et al.

45. With respect to claim 55, **Grotz et al.** teach that the tabs extend generally in a downstream direction. See particularly **Figure 2** of Grotz et al.

46. With respect to claim 57, the operation of the prior art apparatus of **Grotz et al.** will inherently perform the claimed method.

Claim Rejections - 35 USC § 103

47. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

48. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

49. Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Grotz et al. (U.K. 859,993)**.

50. With respect to claim 51, **Grotz et al.** teach a ducted fan gas turbine engine exhaust nozzle arrangement comprising an outer bypass exhaust nozzle an inner core exhaust nozzle. However, **Grotz et al.** does not teach that the inner core exhaust nozzle is of a lobed mixer type. Examiner gives official notice that it was well known in the art at the time the invention was made that lobe type nozzles were used to attenuate the noise generated by an engine. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an inner core exhaust nozzle of the lobe type in Grotz' engine in order to further decrease the noise generated by the engine.

51. With respect to claim 51, **Grotz et al.** teach that a downstream end of the bypass nozzle is further downstream than a downstream periphery of the core exhaust nozzle. See particularly **Figure 1 of Grotz et al.**

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Allowable Subject Matter

52. Claims 6-12, 16, 22, 24, 26-29, 31-33, 37-40, 42, 44, 45, 47 and 56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

53. Claim 4 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Rodriguez whose telephone number is 703-605-1140. The examiner can normally be reached on Monday-Friday 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on 703-308-0102. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0861.

W.R

W.R
June 23, 2003


CHARLES G. FREAY
PRIMARY EXAMINER